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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/764,935	01/26/2004	Michael R. St. John	7773	9633

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EXAMINER	
CORDRAY, DENNIS R	

ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/764,935	ST. JOHN ET AL.	
	Examiner	Art Unit	
	DENNIS CORDRAY	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 March 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13,15-18 and 20-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13,15-18 and 20-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Oath/Declaration

The Declaration under 37 C.F.R. 1.132, filed 3/28/2008, is acknowledged but is not convincing.

The Declaration compares press dewatering using a polymer having reacted glyoxal to acrylamide ratios of 0.20 and 0.26. Although the composition of the polymer is unknown, other than that it has acrylamide and glyoxal-reacted acrylamide monomers, the Declaration reports improvement in press dewatering when using the higher reacted glyoxal ratio. These data are interesting but are not convincing because they are not commensurate with the scope of the claims, as discussed below:

- The composition of the polymer (mole-% acrylamide, mole-% anionic monomers, mole-% cationic monomers, mole-% zwitterionic monomers, mole-% other monomers) is unknown, or whether the same polymer was used (before reaction with the glyoxal) for both tests.
- The two polymers tested cannot possibly support the very broadly claimed compositional range for the polymers.
- The amount of polymer used (0.5 lb to 1.5 lb) per ton is only a small portion of the claimed range.
- The molecular weight of the polymers used is unknown and, in any case, cannot support the very broad range of molecular weight claimed.
- The glyoxal functionalized acrylamide-containing polymers cannot provide support commensurate with the broadly claimed polymers, which can comprise

any amino or amido groups and any aldehydes along with any ionic or zwitterionic monomers. In addition, broad ranges in the amounts of the above monomers are claimed.

- The Examiner is not sure what was actually measured as the Declaration only presents unitless numbers and only states press dewatering. However, the statement that the numbers presented represent the stated improvement is accepted.

The Declaration states that Coscia indicates that no improvement is achieved at levels of reacted glyoxal above greater than 0.12. Example 12 provided by Coscia et al uses a specific polymer (97.8 mole-% acrylamide, 2.2 mole-% DADMAC before reacting with glyoxal) reacted with various amounts of glyoxal added to a specific cellulose fiber suspension. More generally, Coscia also teaches that a ratio greater than 0.6 is required to give practically useful wet strength efficiency and a ratio in the range of 0.10 to 0.20 appears to afford the best wet strength efficiency. Papermaking furnishes differ widely and Coscia et al further teaches that the optimum amount of glyoxal to be taken in any instance is readily found by laboratory trial, with a starting point of one mole of glyoxal per every four moles of vinylamide units present (or a ratio of approximately 0.12). As discussed in a previous Office Action, the upper limit of the optimum range is not taught as an upper limit above which practically useful wet strength efficiency is absent, as is the lower limit of 0.6. Thus, Coscia et al teaches that the ratio 0.12 can be used as a starting point, that a ratio of 0.10 - 0.20 appears to be an optimum range, that values at least over 0.6 are required, and that the optimum ratio can be found through

routine experimentation for a particular instance. While ratio of 0.10 - 0.20 appears to be a preferred range, the wider range of at least 0.06 is also disclosed and significantly overlaps the claimed range.

Response to Arguments

Applicant's arguments filed 3/28/2008 have been fully considered but they are not persuasive.

Applicant argues that Coscia et al expressly teaches against using a reacted glyoxal to vinylamide ratio greater than 0.12. Applicant also argues that Coscia et al unequivocally states that a reacted ratio of more than 0.20 fails to provide a benefit. The range of reacted glyoxal to vinylamide disclosed by Coscia et al, Example 12 is discussed above.

The Examiner agrees that the range of reacted glyoxal to vinylamide ratios of 0.10 – 0.20 taught by Coscia et al does not touch or anticipate the claimed range of greater than 20 mole percent. The sentence in the rejection referring to the ranges touching has been removed. However, the disclosed range of at least 0.06 does overlap and thus anticipates the claimed range. In addition, the range of polymers actually made and tested by Coscia et al includes ratios of 0.25 and 0.50 (Example 12, runs 1 and 2), which lie within the range of at least 0.06 and within the claimed range. "When a claim covers several structures or compositions, either generically or as alternatives, the claim is deemed anticipated if any of the structures or compositions within the scope of the claim is known in the prior art." Brown v. 3M, 265 F.3d 1349, 1351, 60 USPQ2d 1375, 1376 (Fed. Cir. 2001). Also see Titanium Metals Corp. v.

Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (citing In re Petering, 301 F.2d 676, 682, 133 USPQ 275, 280 (CCPA 1962)).

Alternatively, absent convincing evidence of unexpected results commensurate with the scope of the claimed subject matter, obtaining reacted glyoxal to vinylamide ratios within the claimed range would have been obvious to one of ordinary skill in the art.

Regarding the use of the polymers for press section dewatering, it has been discussed in the previous rejections that polymers in papermaking can perform multiple simultaneous functions, such as fixing agents, drainage and retention aids, flocculants, wet or dry strength aids, etc. "Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). When the claim recites using an old composition or structure and the "use" is directed to a result or property of that composition or structure, then the claim is anticipated. In re May, 574 F.2d 1082, 1090, 197 USPQ 601, 607 (CCPA 1978). The polymers of Coscia et al will simultaneously act as wet strength agents and enhance dewatering in a press section for reasons given previously.

The unexpected results have been discussed above.

The outstanding rejections are maintained.

Claim Rejections - 35 USC § 102 and 35 USC § 103

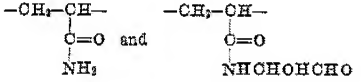
The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-10, 13, 15-18 and 20-22 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as being unpatentable over Coscia et al (3556932) as evidenced by Auhorn et al or Sanchez.

Coscia et al discloses adding an aldehyde-functionalized vinylamide polymers either to preformed paper or to the fibrous suspension in a papermaking process (Abstract; col 7, lines 23-31). The polymers contain at least 50 mole percent, preferably greater than 75 mole percent, and up to 99 mole percent vinylamide (nonionic) units, which are exemplified by acrylamide (col 3, lines 42-60; col 8, Example 1, lines 9-10 and 73-75). The remainder of the monomer units in the polymer can be ionic monomers or nonionic "spacers" (such as vinyl acetate) (col 3, lines 46-49 and 58-60). Ionic monomers include cationic, such as diallyldimethyl ammonium chloride (DADMAC, also exemplified in col 3, lines 42-60; col 8, Example 1, lines 9-10 and 73-75), and anionic, such as acrylic acid (col 5, lines 69-72; col 10, Example 6, lines 45-46). The vinylamide units are partially glyoxylated such that a ratio of glyoxylated to non-glyoxylated units of at least 0.06:1 is obtained. The ratio may be higher and a preferred range of 0.1:1 to 0.2:1 (about 10-20% glyoxylated) gives the best results (col 6, lines 54-67). While the lower limit of 0.06:1 is repeatedly emphasized (col 6, lines 59-66; col 13, lines 1-7; Claim 1), no such emphasis is placed on the upper limit of 0.20:1. Coscia teaches that ratios higher than 0.06:1 can be used but the increase in wet strength is

minimal (col 6, lines 53-58). The Examiner believes that Coscia discloses any ratio above 0.06:1 and that the disclosed upper limit of 0.20:1 is a preferred limit rather than an absolute limit.

The molecular weight of the starting non-reacted polymer can be from 100,000 to 1,000,000 (col 3, lines 64-66) and the glyoxylation reaction adds to the molecular weight. Thus, in some embodiments, the glyoxylated polymer has a molecular weight in the claimed range. The polymeric composition significantly overlaps the claimed compositions. Coscia et al teaches that, in their simplest form, the polymers of the invention comprise the units



which are acrylamide and monoreacted glyoxylated acrylamide, and units that supply ionic charge to the molecule (col 4, lines 48-56).

Coscia discloses that the glyoxylated acrylamide polymer is added to the papermaking fibrous suspension or to the preformed paper in an amount from 0.2 to 2% of the dry weight of the fibers, or from 4 to 40 lb/ton (col 7, lines 24-31 and 38-44) although smaller amounts also impart significant amount of wet strength.

Coscia et al does not disclose that the polymers enhance press section dewatering.

It is known in the art to use polymeric additives in papermaking for multiple simultaneous purposes, such as fixing agents, drainage and retention aids, flocculants

and wet or dry strength aids (Auhorn et al, 6083348, col 2, lines 34-37), thus the claimed polymers can serve more than one purpose in the process. Sanchez teaches that polyacrylamides (100% nonionic), copolymers of polyacrylamide and α,β-unsaturated quaternary ammonium compounds (i.e.-DADMAC) and glyoxylated polyacrylamide-DADMAC copolymers increase dry strength of paper products (col 1, lines 49-51 and 61-63; col 8, lines 32-58). Sanchez also discloses acrylamide-DADMAC copolymers as dry strength agents and teaches that the copolymers provide several other advantages in papermaking processes, such as improved drainage and retention (dewatering aid), improved sheet formation and increased brightness (Abstract; col 2, line 63 to col 3, line 4 and lines 29-30).

The polymer disclosed by Coscia et al is substantially identical to the claimed polymer and Coscia et al adds the polymer to a paper sheet in the claimed amount. In addition to providing temporary wet strength, the copolymers disclosed by Coscia et al will also function to enhance press section dewatering because, where the claimed and prior art apparatus or product are identical or substantially identical in structure or composition, a *prima facie* case of either anticipation or obviousness has been established. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). In other words, when the structure recited in the reference is substantially identical to that of the claims, the claimed properties or functions are presumed to be inherent.

Claims 1-10, 13, 15-18 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coscia et al in view of Bjorquist et as evidenced by Auhorn et al or Sanchez.

The disclosures of Coscia et al, Auhorn et al and Sanchez are used as above and supplemented by the following.

Coscia et al teaches that paper made using the disclosed copolymers has an advantageous property of losing part of its wet strength when soaked in water for a moderate amount of time, and loses substantially all of its wet strength when soaked in alkaline water. The paper is thus suitable for facial and other tissues for which permanent wet strength is undesirable (col 2, lines 33-43).

Bjorquist et al teaches that paper made using the products of Coscia et al could clog septic systems because they lose only about half of their wet strength on exposure to water (col 2, lines 17-25). Bjorquist et al further teaches that the rate of wet tensile decay is enhanced by increasing the relative proportion of hemiacetal bonds (reaction of cellulose hydroxyl groups with the aldehyde functionality) to amidol bonds formed (reaction of primary amide groups groups of one resin polymer with the aldehyde functionality of a second resin polymer. The number of amidol bonds can be reduced by reducing the number of primary amide groups (col 4, lines 26-45). This reduction is accomplished in Bjorquist et al by increasing the fraction of glyoxylated acrylamide to acrylamide and replacing some of the acrylamide monomeric units with non-nucleophilic monomeric units.

Bjorquist et al discloses temporary wet strength resins with molecular weights from 5,000 to 200,000 having improved wet tensile decay over the wet strength resins of Coscia et al (Abs; col 2, lines 17-25). The resins have comprise copolymers of 3-65 mol-% acrylamide, 1-30 mol-% glyoxylated acrylamide, 1-10 mol-% cationic monomer and 5-95 mol-% of a polar non-nucleophilic monomer that does not cause the polymer to become water insoluble (col 3, lines 11-33). The polymers are aldehyde functionalized by reacting with glyoxal (col 6, lines 35-56). Preferred cationic monomers include diallyldimethylammonium chloride (col 5, lines 46-48). Using the disclosed mole percent ranges, the ratio of glyoxylated acrylamide to acrylamide ranges from 0.016:1 to 10:1. In the Examples provided, the ratio ranges from 0.03 to 2.4 (col 13, line 63 to col 15, line 11). The resins are added to paper in the amount from about 0.005% to about 2% by weight of the fiber, or from about 0.1 to about 40 lb/ton (col 9, line 66 to col 10, line 1).

The art of Coscia et al, Bjorquist et al, Auhorn et al, Sanchez and the instant invention is analogous as pertaining to paper containing glyoxylated acrylamide polymers. It would have been obvious at the time of the invention to one of ordinary skill in the art to obtain the claimed ratio of glyoxylated acrylamide to acrylamide in the wet strength resins in the process of Coscia et al in view of Bjorquist et as evidenced by Auhorn et al or Sanchez to improve the wet tensile decay of the paper made using the resins.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Coscia et al, with or withour Bjorkquist et al as evidenced by Auhorn et al or Sanchez.

Coscia et al does not disclose spraying the polymer onto the sheet. Although not explicitly disclosed, spraying is a well known method of applying an aqueous solution to a paper and would have been obvious to one of ordinary skill in the art as a functionally equivalent option. Spraying before press dewatering would also have been obvious to minimize the necessity of an additional dewatering step and to aid in the distribution of the polymer into the paper.

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coscia et al, with or without Bjorkquist, in view of Carrier et al (5654198) as evidenced by Auhorn et al or Sanchez.

Coscia et al does not disclose a polymer containing zwitterionic monomers.

Carrier et al discloses that monomers used in preparing polymers useful in aqueous systems for problems associated with particulates, emulsification and flocculation (i.e.-dewatering) can be anionic, cationic and zwitterionic (col 3, lines 14-49). Carrier et al discloses copolymers comprising acrylamides and the anionic, cationic or zwitterionic monomers (col 3, lines 50-54; col 3, line 66 to col 4, line 11). Pendant aldehyde functionality is added by covalently attaching an aldehyde containing monomer to the acrylamide (col 3, line 67 to 4, line 2; col 4, lines 42-46).

The Examples given in the instant Specification pertain to polymers comprising only acrylamide and DADMAC. No examples are presented of polymers comprising anionic or zwiterionic monomers.

The art of Coscia et al, Bjorkquist et al, Carrier et al and the instant invention are analogous as pertaining to the use of glyoxylated acrylamide polymers in papermaking. Absent evidence of unexpected results due to using zwitterionic monomers, it would have been obvious to one skilled in the art at the time of the invention to use a glyoxylated acrylamide polymer containing the claimed amount of zwitterionic monomers in the process of Coscia et al, with or without Bjorkquist, in view of Carrier et al as evidenced by Auhorn et al or Sanchez as a functionally equivalent option.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DENNIS CORDRAY whose telephone number is (571)272-8244. The examiner can normally be reached on M - F, 7:30 -4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dennis Cordray/
Examiner, Art Unit 1791

/Eric Hug/
Primary Examiner, Art Unit 1791